19-CSE100 PSAT(Problem Solving and Algorithmic Thinking)

SUDOKU SOLVER

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Abstract

This presentation is about Sudoku Solver. In this project we are going to discuss solving Sudoku and solving using flowgarithm programme. The solver solves the puzzle according to user supplied input. The simplicity of puzzle's structure and the low requirement of mathematical skills caused people to have enormous interest in accepting challenges to solve the puzzle.

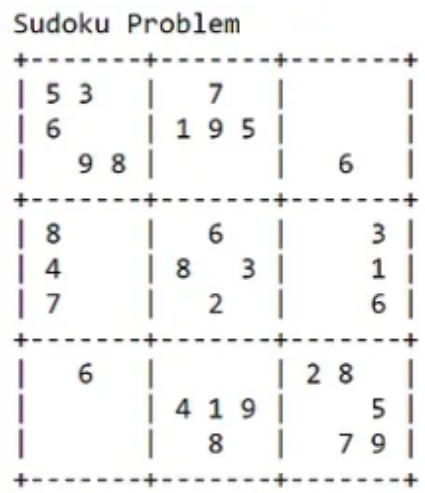

Figure: A general Sudoku Problem

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Introduction

Intoduction:
Sudoku is a logic-based number solving puzzle. Currently, Sudoku puzzles are becoming increasingly popular among the people all over the world. The game has become popular now in a large number of countries and many developers have tried to generate even more complicated and more interesting puzzles.
Today, the game appears in almost every newspaper, in books and in many websites. The Brute force algorithm is then used to compare with this algorithm in order to evaluate the efficiency of the proposed algorithm. The brute force is a general algorithm than can be applied to any possible problem. This algorithm generates any possible solutions until the right answer is found.

Approch:
Our approch in making this sudoku solver programme in solving the puzzle using brute force approch

Rules

It is a 9x9 grid puzzle (81 squares). At the beginning of the game, some squares are filled with digits, while most of them are empty. The goal of Sudoku is to fill those empty squares with digits so that each row, column, and 3×3 section contains numbers between 1 to 9. The players need to use logic to fill in the missing digits and complete the grid so that all the constraints and rules are satisfied. A move is incorrect if:

1. Any row contains more than one of the same digit from 1 to 9.
2. Any column contains more than one of the same digit from 1 to 9
3. Any 3×3 grid contains more than one of the same digit from 1 to 9.

Different types of Sudoku

1. Standard Sudoku
2. Small Sudoku
3. Mini Sudoku
4. Jigsaw Sudoku
5. Jigsaw Sudoku
6. Dodeka Sudoku
7. Giant Sudoku
8. Killer Sudoku
9. Greater Than Sudoku

Brute force approch

One of the better-known algorithms that are used when solving Sudoku on a computer is called brute-force. The brute-force algorithm is sometimes called an exhaustive search algorithm and it has become famous in computer science because of its striking characteristics. It always finds a solution because it will try all possible solutions hence it is not considered to be very effective. A Sudoku solver that uses brute-force will visit all the empty boxes and try to fill it with a number from the available choices. If no error was found after giving a number it will continue to the next empty box and Repeat the process. As soon as a violation to the Sudoku rules is found the algorithm will modify the previous one and continue the process.

Advantages and Disadvantages of brute-force approch

Advantages:

The brute force approach is a guaranteed way to find the correct solution by listing all the possible candidate solutions for the problem.

1. It is a generic method and not limited to any specific domain of problems.
2. The brute force method is ideal for solving small and simpler problems.
3. It is known for its simplicity and can serve as a comparison benchmark.

Disadvantages:

1. The brute force approach is inefficient. For real-time problems, algorithm analysis often goes above the O(N!) order of growth.
2. This method relies more on compromising the power of a computer system for solving a problem than on a good algorithm design.
3. Brute force algorithms are slow.
4. Brute force algorithms are not constructive or creative compared to algorithms th are constructed using some other design paradigms.

Conclusion

Brute-force approch is a technique that was used to get solutions for the problems by exhaustive searching, but it takes a lot of time to solve

We will get a solution but it takes a long time because we have to check each block by trail and error

We can improve the technique by frequently solving the different problems

It was very inefficient we cant solve the puzzle spontaniously

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Thank you

Thank you...!